REMARKS

I. Introduction

In response to the final Office Action dated July 1, 2010, Applicants have incorporated the limitations of claims 9 and 10 into independent claim 1. Applicants have been careful to avoid the introduction of new matter.

Applicants respectfully submit that all pending claims are patentable over the cited prior art for the reasons set forth below.

II. The Rejection Of Claims 1-13 Under 35 U.S.C. § 103

Claims 1-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohara et al. (US 2004/0209148). Applicants respectfully traverse this rejection of the pending claims for at least the following reasons.

With regard to the present disclosure, amended independent claim 1 recites, in-part, a fuel cell comprising a cooling fluid channel for supplying and exhausting a cooling fluid for cooling a membrane electrode assembly which is formed in at least one of an anode-side separator and a cathode-side separator, a fuel gas channel for supplying and exhausting a fuel gas serving as a reaction gas to the membrane electrode assembly which is formed in the anode-side separator, and an oxidant gas channel for supplying and exhausting an oxidant gas serving as a reaction gas to the membrane electrode assembly which is formed in the cathode-side separator.

An upstream portion of the cooling fluid channel of at least one of the anode-side separator and the cathode-side separator is formed such that it includes at least one of a region corresponding to an anode-side gap formed between the anode-side gasket and the membrane electrode assembly and a region corresponding to a cathode-side gap formed between the

cathode-side gasket and the membrane electrode assembly. The upstream portion of the cooling fluid channel is formed such that it includes a region corresponding to a middle stream portion and a subsequent portion of at least one of the fuel gas channel and the oxidant gas channel.

The upstream portion of the cooling fluid channel, the anode-side gap, the cathode-side gap, the middle stream portion and the subsequent portion are arranged to allow water vapor contained in the reaction gas that flows into the anode-side gap and water vapor contained in the reaction gas that flows into the cathode-side gap to condense in at least a part of the anode-side gap and the cathode-side gap, and to allow the condensed water to fill at least one of the anode-side gap and the cathode-side gap.

The cooling fluid channel, the fuel gas channel and the oxidant gas channel are formed such that their main portions are substantially parallel to each other. In at least one of the anode-side separator and the cathode-side separator, a flow direction of the cooling fluid that flows in an inside region of the cooling fluid channel from upstream to downstream and a flow direction of a reaction gas that flows in an inside region of each of the fuel gas channel and the oxidant gas channel from upstream to downstream are substantially the same.

It is admitted in the Office Action that Ohara fails to disclose that the cooling fluid channel, the fuel gas channel and the oxidant gas channel are formed such that their main portions are substantially parallel to each other. However, the Office Action asserts that that it would have been obvious to rearrange the flow fields to be parallel in order to have inlets and outlets on the same sides, since it is held that rearranging of parts involves only routine skill in the art. Applicants respectfully disagree.

If the flow field of Ohara were rearranged such that the flow direction of the cooling fluid and the direction of the reaction gas are substantially the same, the upstream portion of the

cooling fluid channel would not correspond to the middle stream portion and subsequent portion of the reaction gas channel, as is required in claim 1 of the present disclosure. This is due to Ohara having a cooling fluid channel with only a conventional serpentine structure. For example, if the cooling channel of Ohara were rotated by 90 °, the upstream portion, middle stream portion and downstream portion of the cooling fluid channel would be positioned in the vicinity of the upstream portion, middle stream portion and downstream portion of the reaction gas channel, respectively.

Thus, because Ohara does not disclose that the cooling fluid channel, the fuel gas channel and the oxidant gas channel are formed such that their main portions are substantially parallel to each other, Ohara also fails to disclose an upstream portion of the cooling fluid channel is formed such that it includes a region corresponding to a middle stream portion and a subsequent portion of at least one of the fuel gas channel and the oxidant gas channel. As such, a skilled artisan can not derive the claimed arrangement based on the teachings of Ohara.

In contrast to Ohara, in the present disclosure, the middle stream and subsequent portion of the reaction gas channel where there is a large amount of water vapor is positioned in the vicinity of the upstream portion of the cooling fluid channel where a cooling fluid with low temperature flows. Accordingly, the water vapor having flown into the gap is effectively cooled and condensed there, to fill the gap with condensed water. This prevents the reaction gas from leaking, thus improving the utilization rate of the reaction gas as well as sufficiently exhibiting the power generation performance.

Furthermore, the differences between the claimed arrangement and Ohara have been demonstrated in the present specification. A variation of the cooling fluid channel obtained by rotating the cooling fluid channel of Ohara by 90 °, as pointed out by the Examiner, corresponds

to Comparative Example 1 of the present disclosure (see, paragraphs [00250]-[0253] of the specification and Figs. 31-33). As is shown in the specification, Comparative Example 1 failed to exhibit sufficient power generation performance (see, Table 1 in paragraph [0257]). Thus, a skilled artisan would not have found the present claims obvious in view of Ohara.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As is clearly shown, Ohara does not disclose a cooling fluid channel, a fuel gas channel and a oxidant gas channel that are formed such that their main portions are substantially parallel to each other. Accordingly, Applicants submit that Ohara does not render claim 1 of the present disclosure obvious and as such, claim 1 is patentable and allowable over the cited prior art. Accordingly, Applicants respectfully request that the § 103(a) rejections of claim 1 be withdrawn.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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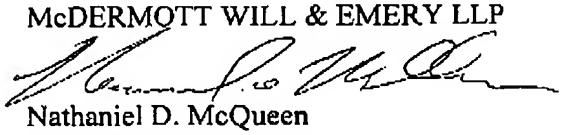

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